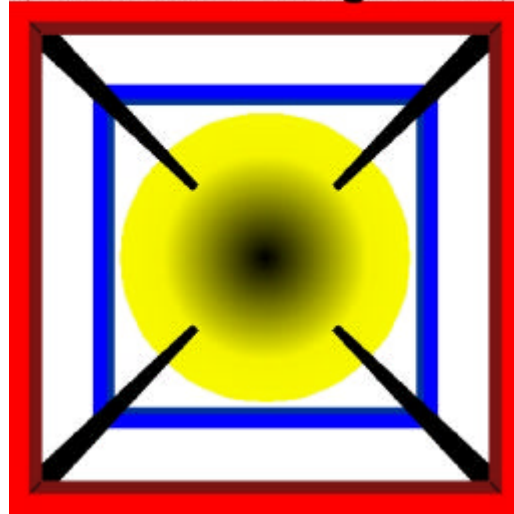
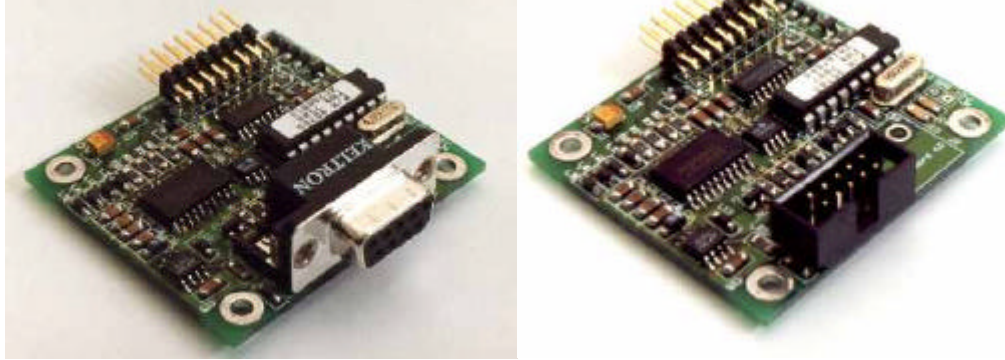


Industrial Design, Inc.



# TS-101, TS-109 and TS-110 Serial Touch Screen Controllers





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## Description

The **TS101**, **TS-109** and **TS-110** line of Serial Touch Screen Controllers connect between a 4-wire, 5-wire or 8-wire Resistive Touch Screen and a computer system, allowing the use of a Touch Screen as the system's user interaction input device, emulating a standard serial Mouse Input.

Industrial Design, Inc. currently manufacturers and sells three different Serial touch Screen Controllers:

1. The **TS-101** - a PC/104-16 based Serial Touch Screen Controller Add-On Board with its own integrated Extra Serial Port
1. The **TS-109** - a Stand-alone Serial Touch Screen Controller Board with an RS-232, DB-9, Female Serial Interface and external Power Supply for use with an existing standard RS-232 Serial Port.
1. The **TS-110** - a Stand-alone Serial Touch Screen Controller Board with an RS-232, 10-pin Header, Male Serial Interface with Data Cable-supplied power for use with an RS-232 10-pin Header/Power Serial Port.

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## Product Overview

The **TS-101** is a PC/104 16-bit Add-On Board containing both DynaPro's **SC3** Serial Touch Screen Controller and an integrated, on-board Serial Port for direct

interface of this controller to a PC/104 capable computer system without the use of any of the existing serial ports in the system. The integrated Serial Interface (COM Port) can be set at any 8-bit boundary I/O address between 000H and 7FFH and can use any of the free Interrupts in the system.

The **TS-109** and the **TS-110** both contain the same **SC3** Serial Touch Screen Controller as the **TS-101**, but the controllers connect to the system via one of the system's existing serial ports. The two controllers are, essentially, the same, but the **TS-109** has a "normal" DB-9, Female Serial Interface connector for use with a "normal" Serial Port and also needs between +5V and +12V power supplied from an external source, whereas the **TS-110** has a 10-pin, Male Serial Interface Header for flat-ribbon based serial connection through which the power may also be supplied. The **TS-110** - was built for direct-connect use, and provides both the serial data and the power supply in the same 10-pin ribbon cable.

All of these Serial Touch Screen Controllers allow the use of a normal, 4-wire, 5-wire or 8-wire Resistive Touch Screen instead of, for instance, a Mouse. The controllers are delivered complete with User Manual and the latest version of DynaPro's Touch Screen Driver Software for any of the Operating Systems shown below. These drivers emulate a standard Mouse Input, and can, therefore be used with any software requiring Mouse based input.

The Touch Screen add-on glass is easily mounted in front of an LCD Panel (please specify screen size!) or a CRT Screen, and is integrated into the system via one of these Serial Touch Screen Controllers.

The Touch Screen Software Drivers make the Touch Screen act like a normal Mouse input. These Drivers are available for several different operating systems, like MS-DOS, WINDOWS 3.1x, WINDOWS FOR WORKGROUPS, WINDOWS 95/98, WINDOWS NT or UNIX (please specify operating system when ordering)!

The use of Touch Panels is especially GREAT for use in both industrial and/or military environments, in environments with heavy moisture, dust, contamination, mechanical shock or vibrations. In addition, a typical use is in 'INFORMATION KIOSKS', factory floor input and information devices, or other public or industrial information retrieval systems.

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## Technical Data

1. Touch Screen Type: Resistive
2. Number of wires: 4 or 8
3. Form factor: TS-101: Standard PC/104  
TS-109 and TS-110: Stand-alone board
4. Dimensions: TS-101: Standard PC/104: 3.550" \* 3.775" (W \* L) (= 90.170mm \* 95.885mm (W \* L))

5. Interface: TS-109 and TS-110: 2-1/8" x 1-7/8" (= 53mm x 48mm)  
TS-101: PC/104 - 16-bit (= PC/AT electrical interface)  
TS-109: RS-232 - DB9 - Female plus Power  
TS-110: RS-232 - 10-pin header w. power.
6. I/O Addresses: TS-101: 0000 - 07FF (8-bit intervals)  
TS-109 and TS-110: As Serial Port used.
7. IRQ: TS-101: 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15 (any available)  
TS-109 and TS-110: As Serial Port used.
8. IRQ Sharing: TS-101: On-board Jumper.  
TS-109 and TS-110: N/A (as Serial Port used).
9. Controller: DynaPro SC3
10. Resolution: 10 bits
11. Voltage: TS-101: +5V to 20V, GND (from PC/104 bus)  
TS-109 and TS-110: GND and between +5V to +20V
12. Operating temperature: 0 - 70 Centigrades
13. Humidity: 0 - 95%, non condensing
14. Serial Interface: TS-101: 16C550 based  
TS-109 and TS-110: As serial Port used.
15. Serial Speed: 2400 or 9600 bps
16. Emulation: Serial Mouse Input
17. Driver software: MS-DOS, Windows 3.1x, WFWG 3.1x, Windows 95/98,  
Windows NT 3.5x/4.0, UNIX (Windows CE from Eclipse)

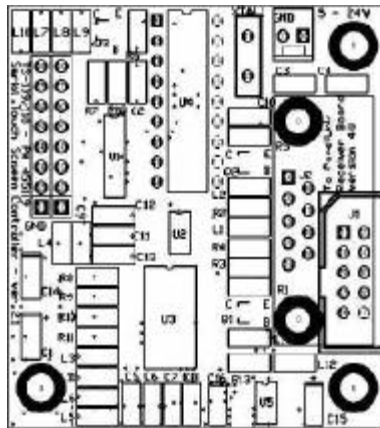
## Product Pictures



TS-109



TS-110

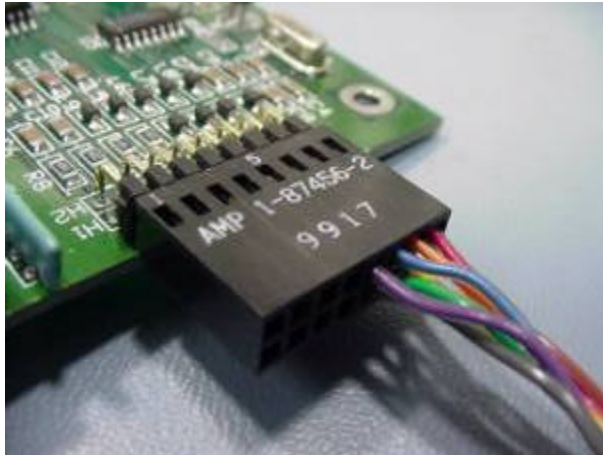


## Board Outline

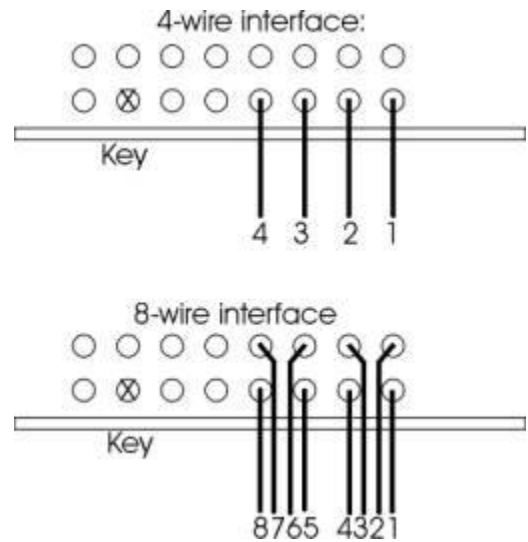
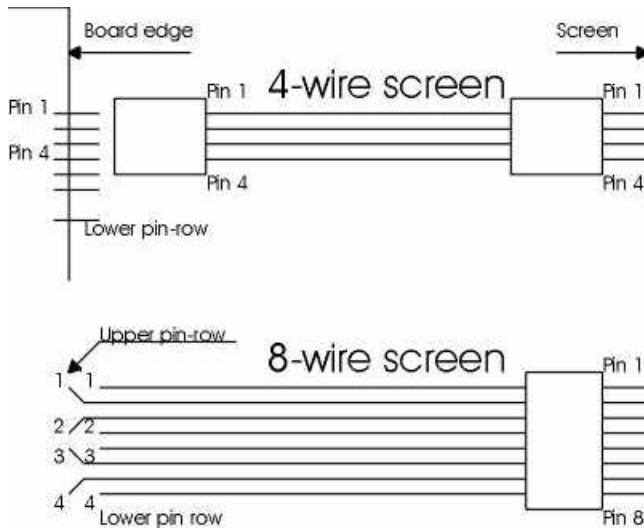
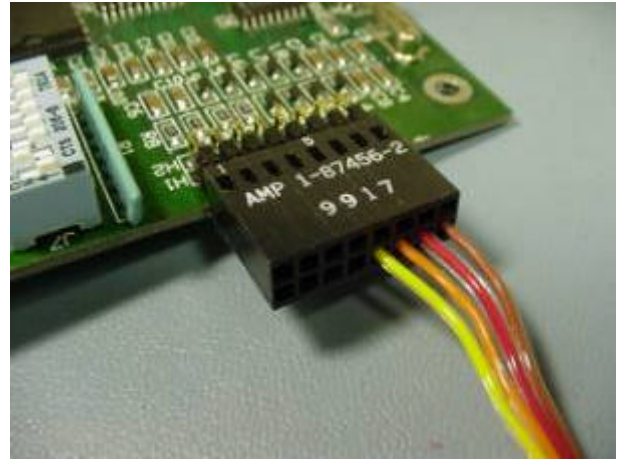


# Touch Screen Interface cable

## 8-wire interface



## 4-wire Interface





## How to install the module under WINDOWS 95/98

1. **On the COM Port you are going to use to connect the Serial Touch Screen Controller to the system:**
  1. Make sure the COM Port is installed and active.
  2. Note the I/O Address and the Interrupt Number for the COM Port you are going to use.
  
1. **Make sure the PC's power is OFF. Now connect the Serial Touch Screen Controller to the desired COM Port on the Computer:**
  1. For the TS-109, connect it to a DB-9 Male connector of an available COM Port. Also connect the Power supply to the Controller (it uses +5V to +12V)
  2. For the TS-110, connect it to the COM1 Port on INSIDE's PanelLink receiver Board, or to COM2 Port on INSIDE's Single-Board Computer with the supplied Data-Power Cable (See cable drawing below). Note that any standard pin-out 2\*5 pin male header COM Port connector where Pin 10 carries +5V to +12V can be used.
  3. Connect the Touch Screen's connecting wire to the Serial Touch Screen Controller Screen Input connector. Note that this connector is keyed to prevent incorrect insertion)
  
2. **Switch the PC ON and allow Windows 95/98 to load.**
  
3. **If it is not already installed, or if Windows 95/98 does NOT discover a newly installed serial port automatically when it loads, then install the new serial port into Windows (Note: you can skip this step if the port was already installed):**
  1. Enter Control Panel (Start button, Settings, Control Panel, or: My Computer - Control Panel Icon)
  2. Double-click the Add New Hardware Icon
  3. Click Next
  4. Select No and click Next
  5. Select Ports (COM & LPT) and click Next
  6. Click Next
  7. Click Next
  8. Click Finish
  9. Click No (do not re-start yet).
  
4. **If necessary, set the new serial port's Input/Output Address and IRQ to the correct values:**
  1. Enter Control Panel
  2. Double-click the System Icon
  3. Click the Device Manager Tab (top)
  4. Double-click Ports (COM & LPT)
  5. Select Communications Port (COM3) (or whatever the number of the new COM Port is)
  6. Click Properties
  7. Click Resources

8. Click the Input/Output Range and then Change, and set to the correct setting (You may have to un-click "Use automatic settings" and select the next Basic Configuration number for this to be allowed)
  9. Click the Interrupt Request and then Change, and set to the correct setting (You may have to un-click "Use automatic settings" and select the next Basic Configuration number for this to be allowed)
  10. Click OK
  11. Click No (do not re-start yet)
  12. Click Close
  13. Click No (do not re-start yet)
- 6. Install the Touch Screen Driver Software for WIN95/98:**
1. Insert the diskette labeled SC3 WIN95/98 Driver into floppy drive A: (or B:)
  2. Enter Control Panel
  3. Double-click Add New Hardware Icon
  4. Click Next
  5. Select No and click Next
  6. Select Mouse and click Next
  7. Click the Have Disk button
  8. Click OK
  9. Click Next
  10. Click Finish
  11. After a while, a small windows appears saying: "Failed to connect to .....". It disappears after some seconds.
- 7. Restart your PC to load the software for the extra COM Port.**
- 8. Start the Touch Screen Configuration Software:**
1. Click Start, Programs, Touch Screen Utilities, Touch Screen Configuration
  2. Inside the Configuration software, click Interface
  3. If a small window appears saying "Can't connect to the touch ...", click OK, Exit, and then re-start windows. When windows is back up, re-start the Touch Screen Configuration and then click Interface again, as shown in a) and b) above
  4. In the Interface screen, set the correct Interrupt (defaults are: COM1 and COM3 = IRQ4, COM2 and COM 4= IRQ3) and the correct Address (defaults are; COM1 = 3F8, COM2 = 2F8, COM3 = 3E8, COM4 = 2E8), as you set these on the module and in the System Device COM Port set-up.
  5. Before you continue, make sure RS-232 and Host buttons are selected. If they are not, click them both.
  6. Click the Advanced Button
  7. Set the Screen Wires to 4 (maybe 5) or 8 as appropriate (count the number of wires in the wire connection the screen to the Serial Touch Screen Controller)
  8. Click OK.
  9. If a small windows appears saying "Touch controller is not responding, then click Cancel (another window appears saying: "parameters cannot be ..."), then OK, then OK, then EXIT and re-start windows, and re-enter the Touch Screen Configuration utility as shown in a) above.
  10. Click Calibration
  11. Click Calibrate
  12. Follow the screen prompts (upper left, lower right and then 3/4 up+right)
  13. Click or touch OK
  14. Click or touch Exit

**Your TS-109 or TS-110 Serial Touch Screen Controller and Touch Screen are now ready for use!**

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## Trouble Shooting:

The most typical error is incorrect setting of Input/Output Address and/or Interrupt Number for the COM Port whereto the Serial touch Screen Controller is connected. These should be checked both in the Systems Settings and in the Touch Screen Configuration Settings.

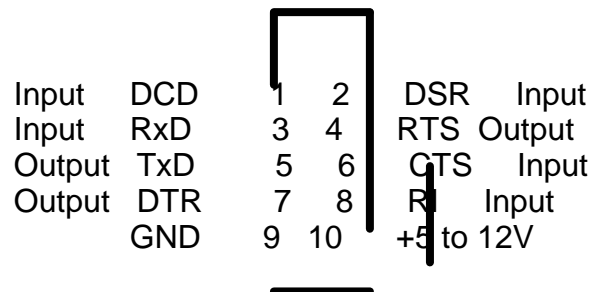
To check System Settings, go via: Control Panel, System, Device Manager, Ports (COM & LPT), Communications Port (COMx), Properties, Resources, Input/Output Address and Interrupt Number.

To check Touch Screen Settings, go via: Touch Screen Configuration, Interface, Interrupt Number and Input/Output address (while you are at it, check the Advanced setting for correct number of wires)

If you alter any of these settings, you will have to re-start windows before the Touch Screen will work and/or can be calibrated.

Note also: You must Calibrate the Touch Screen before you can use it, as shown above.

Enclosed here for reference, are the typical pin-outs and signals of a normal 2\*5 pin Serial COM Port Header. Notice that these are the same signals, and map 1-to-1 with the signals, in the normal DB-9 Female COM Port connector, except for pin 10 (+5 to 12V) which is NOT present in the DB-9 connector!



Enjoy!

The Design Team at

**Industrial Design, Inc.**

# Combined Serial Data and Power

## Flat-Ribbon Interface Cable for TS-110

This note shows how to make the cable that is mounted between the TS-110 2\*5 pin male shrouded header and a typical 2\*5 pin male shrouded COM Port header on a typical SBC or other board.

1. Cut a 10-wire flat ribbon cable to 18" (or any other length that the customer wanted)
2. Mount a 2\*5 pin female IDC Connector on the one end.
3. Slide a second connector over the other end, but leave it non-attached, to allow the customer to mount this connector at the length he wants and cut the cable.

That's it. Pack it up and ship it. You're done!

**Customer:** Remember to press the top of connector 2 in place before use!

Enjoy!

The Design Team at

**Industrial Design, Inc.**

*This page was last updated on Wednesday, March 15, 2000 at 6:55p.m.  
Max Jensen*